Spin meeting minute, 12/07/2005

Waldo presented a new idea to calibrate RHIC snake at injection with turn-by-turn polarization measurement. With only one snake on, the stable spin direction is in the horizontal plane. With vertical polarization injected, the spin will precess when the snake is slightly detuned (say by 0.5 degree). Using 1 event/bunch crossing, the Monte Carlo simulation shows that FFT of the asymmetry signals measured with 30 bunches over 16k turns gives the spin tune. Thomas commented that actual event rate at injection is lower (it was 0.2-0.3 for 0.8×10^{11}/bunch in last run). It also worthwhile to study two-snake case with horizontal polarization injection (at $G\gamma$=integer).

Ioannis reported his simulation results with "piggy-bag" power supplies for A17 and E17 quads as compensating quads for snakes. With Nick's recent solutions for the compensation quads, the simulation shows that at least in one case, the voltage is near the power supply's limit. He asks for time to test it before use. Woody commented that all such request would need power cost estimate. Kevin commented there might be one or two new power supplies which could meet the requirement, so we don't need the "piggy-bag" solution.

Thomas reported the lattice design he presented at Japan last week for the polarized J-PARC. The J-PARC is a machine similar to AGS in many sense: 180MeV linac, 3GeV Booster and 50GeV main ring. The polarization related devices are similar to what we have already (polarized H^- source, polarimeters, partial snakes), except an AC dipole in the Booster and possible a tune jump system. There are two advantages of this new accelerator. First, with two equally strong partial snake (25-30%), the spin tune gap is wide enough to put horizontal tune in the gap. Horizontal resonance is not an issue. Second, a higher injection energy makes the lattice matching at injection easier.

Haixin